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ROSARIO, DENNIS	
ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,961

Applicant(s)

BEAN ET AL.

Examiner

Dennis Rosario

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE 8/16/2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-9 and 12-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9 and 12-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/29/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment was received on August 16, 2005. Claims 1-5,7-9 and 12-28 are pending.

Double Patenting

2. Due to the abandonment of Application No. 09/908,019, the double patenting rejection is withdrawn.

Claim Rejections - 35 USC § 112

3. Due to the amendment of claim 3, the 112 rejection is withdrawn.

Response to Arguments

4. Applicant's arguments filed 8/16/2005 on page 8 with respect to claim 1 have been fully considered but they are not persuasive and states:

...Bacs does not disclose:

A digital image capturing device...comprising...a processor that

- (a) allows a user to select one of [a] plurality of exposure patterns,
- (b) applies the selected exposure pattern to said shutter device in response to activation of [a] shutter button..., and
- (c) records on a storage device only a single image of the object as a result of the complete application of the exposure pattern [i.e., in response to activation of the shutter button].

However, the examiner respectfully disagrees since Bacs does disclose:

A digital image capturing device (fig. 14, num. 166)...comprising...a processor (fig. 19, num. 222 inherently includes a processor) that

(a) allows a user to select (via fig. 19,num. 220) one of [a] plurality of exposure patterns (A user is able to use fig. 19,num. 220 to select or "introduce" in col. 10, line 64 one of a plurality of exposure patterns or "stationary lens apertures" in col. 10, lines 64,65 where two lens apertures are shown in fig. 8, numerals 92c and 96. Note that the claimed pattern is interpreted as at least two objects spaced apart such as shown in fig. 8, numerals 92c and 96 where the space is the diagonally shaded region.),

(b) applies the selected exposure pattern to said shutter device (The method of fig. 9 applies the selected exposure pattern to said shutter device as shown in fig. 8.) in response to activation of [a] shutter button ("keypad" in col. 15, line 12. Thus a user is able to control a "lens apertures" in col. 15, line 13 or the above mentioned stationary lens apertures as shown in fig. 8, numerals 92c and 96 via "parameters" in col. 15, line 13)..., and

(c) records on a storage device (fig. 8, num. 108) only a single image ("record a scene image" in col. 10, line 20) of the object as a result of the complete application of the exposure pattern (or "halt the lens aperture scanning motion as the camera shutter closes" in col. 10, lines 20,21. Thus, the camera shutter is open or exposed, records a single image and closes the shutter to finish exposure.) [i.e., in response to activation of the shutter button. Note that the above mentioned keypad or user interface of fig. 19, num. 220 can be considered a "manual...control..." in col. 10, line 60 to control the "aperture 96" in col. 10, line 61 of fig. 8 and the "stationary lens apertures" in col. 10, lines 64,65. Note that aperture 96 of fig. 8 is described in terms of "mov[ing]" in col. 10, line 56; however, aperture 96 can be interpreted as one of the "one or more...stationary lens apertures" in col. 10, lines 64,65.].

5. Applicant's arguments, see pages 10-12, filed 8/16/2005, with respect to the rejection of claim 21 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bacs, Jr. et al. (US Patent 5,678,089 A) in view of Inaba et al. (US Patent 4,958,912 A).

6. Applicant's arguments, see pages 12-14, filed 8/16/2005, with respect to the rejection(s) of claim(s) 3 and 12-14 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kleinberger et al. (US Patent 5,822,117 A)

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1,2,4,5,7-9,16-20 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by (Bacs, Jr. et al. (US Patent 5,678,089 A).

Regarding claim 1, Bacs, Jr. et al. discloses a still digital image capturing device (Fig. 13, num. 150 is a camera.) that enables a user to capture a single image (Fig. 13, num. 150 is a camera that captures a single image on a “frame by frame basis” in col. 11, line 18.) of an object (fig. 13, label: “A”), comprising:

a) a shutter button (“keypad” in col. 15, line 12. Thus, a user is able to control a “lens apertures” in col. 15, line 13 or the above mentioned stationary lens apertures as shown in fig. 8, numerals 92c and 96 via “parameters” in col. 15, line 13. Note that the apertures are interpreted as shutters.)

b) an electronic imaging sensor device (Fig. 13, num. 22 is an electronic imaging sensor device or “imaging plane” in col. 13, line 41.) comprising:

a1) a plurality of pixels (Fig. 13, num. 22 is an electronic imaging sensor device or “imaging plane” in col. 13, line 41 that comprises an IMAGE FRAME BUFFER 154 of fig. 13 and a “CCD array” in col. 5, line 42. Thus, the IMAGE FRAME BUFFER and the CCD array contains images made of pixels.); and

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c) an electronically actuable shutter device (Fig. 13, num. 22 is an electronic imaging sensor device or "imaging plane" in col. 13, line 41 that comprises an electronicall actuable shutter device shown in fig. 13, num. 28 which is an "optical element" in col. 13, line 38 as shown in detail in figure 8 which can be used as a shutter in col. 15, lines 47-49 and is connected to an ACTUATOR 34 of fig. 13.) comprising:

c1) a plurality of individually addressable and actuable shutter elements (Fig. 13, num. 28 comprises a plurality of individually addressable and actuable shutter elements shown in fig. 8 which shows a detail of the shutter 28 of fig. 13 where shutter elements 92 are "individually addressed" in col. 10, line 53 and actuable via ACTUATOR 34 of fig. 13.), each of said plurality of individually addressable shutter elements (The shutter elements 92 of fig. 8) substantially corresponding to at least one of said plurality of pixels (The shutter elements 92 are used to capture the image using the IMAGE FRAME BUFFER and CCD array, thus the shutter elements capture an image that comprises pixels corresponding to the IMAGE FRAME BUFFER and CCD array.);

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d) a storage medium (Fig. 13, num. 156 is a storage medium.) that stores a plurality of exposure patterns (Fig. 13, num. 156 is a storage medium that "can readily introduce" in col. 10, lines 63,64 the exposure patterns or "apertures" in col. 10, line 65 as shown in figs. 5(a)-5(d) because each aperture as shown in fig. 13,num. 30 exposes an imaging plane as shown in fig. 13,num. 22. Note that readily introduce implies that a pattern is stored on the storage medium 156 of fig. 13, because the term "readily introduce" is used in the context of "programmed...computer" in col. 11, line 4 such as fig. 13, num. 156.); and

e) a processor (Fig. 13, num. 158: CONTROLLER) that

e1) allows a user to select one (The CONTROLLER receives input via a computer 156 of fig. 13 with a user interface as shown in fig. 19, num. 220: USER INTERFACE to select one pattern of patterns shown in figs. 5(a)-5(d).) of said stored plurality of exposure patterns (The CONTROLLER receives input via a computer 156 of fig. 13 with a user interface as shown in fig. 19, num. 220: USER INTERFACE to select one pattern of patterns shown in figs. 5(a)-5(d) of said stored plurality of shutter exposure patterns of fig. 13, num. 156 that is a storage medium that "can readily introduce" in col. 10, lines 63,64 the patterns or "apertures" in col. 10, line 65 as shown in figs. 5(a)-5(d).),

e2) completely applies the selected exposure pattern (Fig. 13, num. 158: CONTROLLER completely applies the selected shutter exposure pattern of fig. 5(a), which is referred to as a "lens aperture" in col. 10, line 18 that is different from a "parallax scanning pattern" in col. 10, line 19 as shown in figs. 6a-6f, when the "shutter closes" in col. 10, line 21.) to said shutter device (The pattern of fig. 5(a) is applied to fig. 13, num. 28 which is an optical element that corresponds to the claimed shutter device.) in response to activation (or "entries" in col. 15, line 12) of the shutter button ("keypad" in col. 15, line 12) to allow light reflected from the object (fig. 13, label "A") whose image is to be captured (via fig. 13,num. 22)...

... to illuminate (Light is allowed thru fig. 13,num. 28 via an aperture 30.) said imaging sensor (Fig. 13, num. 22 captures an image of an object using light.) through said selected exposure pattern (Fig. 5(a)), and

e3) records on a storage device (fig. 8, num. 108) only a single image ("record a scene image" in col. 10, line 20) of the object as a result of the complete application of the exposure pattern (or "halt the lens aperture scanning motion as the camera shutter closes" in col. 10, lines 20,21. Thus, the camera shutter is open or exposed, records a single image and closes the shutter to finish exposure.). Note that the above mentioned keypad or user interface of fig. 19, num. 220 can be considered a "manual...control..." in col. 10, line 60 to control the "aperture 96" in col. 10, line 61 of fig. 8 and the "stationary lens apertures" in col. 10, lines 64,65. Note that aperture 96 of fig. 8 is described in terms of "mov[ing]" in col. 10, line 56; however, aperture 96 can be interpreted as one of the "one or more...stationary lens apertures" in col. 10, lines 64,65.].

Claim 16 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 of a device claim is equally applicable to claim 16 of a method claim.

Regarding claim 2, Bacs, Jr. et al. discloses the apparatus of claim 1, wherein said imaging sensor device (Fig. 13, num. 22 is an "imaging plane" in col. 13, line 41.) comprises a two-dimensional array of pixel elements (Fig. 1 shows num. 22 of fig. 13 as a two-dimensional array.) and said shutter device (Fig. 13, num. 28 is an optical element in col. 13, line 38 that can be used as a shutter in col. 15, lines 47-49 and is connected to an ACTUATOR 34 of fig. 13.) comprises a LCD element (Fig. 8, num.90 is a detailed view of fig. 13,num. 28 which is a "liquid crystal. . .panel" in col. 10, line 50.) comprising:

a) a two-dimensional array of individually addressable and actuatable shutter elements (Fig. 8 shows a detail of the shutter 28 of fig. 13 where shutter elements 92 are "individually addressed" in col. 10, line 53.) corresponding to said two-dimensional array of pixel elements (Fig. 13 shows the shutter elements 28 corresponding with the 2 dimensional array of pixel elements 22.).

Regarding claim 4, Bacs Jr. et al. discloses the apparatus of claim 1, wherein said shutter device (Fig. 13, num. 28 is an optical element in col. 13, line 38 that can be used as a shutter in col. 15, lines 47-49) comprises a microelectromechanical shutter element (The optical element has a "mechanical link" in col. 6, line 1,2.) comprising a two-dimensional array of individually addressable and actuatable shutter elements (Fig. 8 shows a detail of the shutter 28 of fig. 13 where shutter elements 92 are "individually addressed" in col. 10, line 53.).

Regarding claim 5, Bacs Jr. et al. discloses the apparatus of claim 1, further comprising a memory (Fig. 8,num. 94:DRIVER is a program in col. 11, lines 3,4.) including an address storage (The DRIVER that includes addresses that correspond to patterns in col. 10, lines 53-58.) capable of storing one or more shutter element addresses (The DRIVER is capable of storing addresses since the DRIVER is a program and the program has to be on a storage medium.)

Regarding claim 7, Bacs Jr. et al. discloses the apparatus of claim 1., wherein at least one of said exposure patterns (Fig. 5a is a pattern.) specify a plurality of exposure time periods (One of the patterns "per second" of figure 6 can be used in col. 3, lines 49,50.) corresponding to a plurality of shutter elements (Fig. 8, num. 90 is used to create the patterns of fig. 6.) to be actuated (Fig. 8,num. 90 also shown in fig. 13,num. 28 is connected to an actuator, fig. 13, num. 34.).

Regarding claim 8, Bacs Jr. et al. discloses the apparatus of claim 1, wherein said shutter device (Fig. 13, num. 28 is an optical element in col. 13, line 38 that can be used as a shutter in 01. 15, lines 47-49) is formed on and is substantially co-planar with said imaging sensor device (Fig. 13,num. 28 is aligned represented as a horizontal line with sensor, fig. 13, num. 22.).

Claims 9 and 17 are rejected the same as claim 8. Thus, argument similar to that presented above for claim 8 is equally applicable to claims 9 and 17.

Regarding claim 18, Bacs, Jr. et al. teaches the method of claim 16, wherein the providing said shutter device step comprises:

a) providing a two-dimensional array of individually addressable shutter elements (As shown in fig. 8),

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a1) wherein a pixel unit (An "array" in col. 5, line 42 corresponds to the claimed pixel unit and is used for "imaging plane 22" in col. 5, line 41.) of said imaging sensor device (An "array" in col. 5, line 42 corresponds to the claimed pixel unit and is used for "imaging plane 22" in col. 5, line 41 of said imaging sensor device of fig. 13, num. 22 and is shown in fig. 14,num. 162 wherein fig. 15 is a detail of fig. 14,num. 166 where numeral 170 of fig. 15 also represents the imaging sensor device of fig. 13, num. 22.) is individually addressable (An "array" in col. 5, line 42 corresponds to the claimed pixel unit and is used for "imaging plane 22" in col. 5, line 41 of said imaging sensor device of fig. 13, num. 22 and is shown in fig. 14,num. 162 wherein fig. 15 is a detail of fig. 14,num. 166 where numeral 170 of fig. 15 also represents the imaging sensor device of fig. 13, num. 22 is individually addressable via an "optical element 28" in col. 13, line 38 of fig. 13,num. 28 which is shown in detail in fig. 8 that "individually address[es]" in col. 10,line 53 the squares of fig. 8,num. 92 to be "imaged on imaging plane 22" in col. 8, line 14.),

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a2) wherein a first shutter element (Fig. 16(b), upper num. 190 is a first shutter element because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines.) of said pixel unit (Fig. 16(b), upper num. 190 is a first shutter element because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines of said "array" in col. 5, line 42, which corresponds to the claimed pixel unit, and is used for "imaging plane 22" in col. 5, line 41 and shown in fig. 15, num. 170.) polarizes light (Fig. 16(b), upper num. 190 is a first shutter element, because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines of said "array" in col. 5, line 42, which corresponds to the claimed pixel unit, and the array is used for the "imaging plane 22" in col. 5, line 41 and shown in fig. 15, num. 170, that polarizes or "rotate" in col. 14, line 11 light represented as a series of horizontal lines from numerals 170-174 in fig. 15 and in fig. 16(b) as two lines 196. Note that polarization is a form of rotation or orientation.)...

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... according to a first polarization orientation (Fig. 16(b), upper num. 190 is a first shutter element, because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines of said "array" in col. 5, line 42, which corresponds to the claimed pixel unit, and the array is used for the "imaging plane 22" in col. 5, line 41 and shown in fig. 15, num. 170, that polarizes or "rotate" in col. 14, line 11 light represented as a series of horizontal lines from numerals 170-174 in fig. 15 and in fig. 16(b) as two lines 196 according to a first polarization orientation of 90 degrees, which is implicit based on the discussion of fig. 16(c) in col. 14, lines 26-28, rotated from a "correct orientation [of 180 degrees]" in col.14, line 11.) and a second shutter element of said pixel unit polarizes light according to a second polarization orientation (Fig. 16(b), lower num. 190 is a second shutter element, because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines of said "array" in col. 5, line 42, which corresponds to the claimed pixel unit, and the array is used for the "imaging plane 22" in col. 5, line 41 and shown in fig. 15, num. 170, that polarizes or "rotate" in col. 14, line 11 light represented as a series of horizontal lines from numerals 170-174 in fig. 15 and in fig. 16(b) as two lines 196 according to a second polarization orientation of 90 degrees, which is implicit based on the discussion of fig. 16(c) in col. 14, lines 26-28, rotated from a "correct orientation [of 180 degrees]" in col.14, line 11.)...

...that is substantially orthogonal to said first polarization orientation (Fig. 16(b), lower num. 190 is a second shutter element, because it is an element that modifies a shutter's output represented in fig. 15, num. 188 as a series of lines of said "array" in col. 5, line 42, which corresponds to the claimed pixel unit, and the array is used for the "imaging plane 22" in col. 5, line 41 and shown in fig. 15, num. 170, that polarizes or "rotate" in col. 14, line 11 light represented as a series of horizontal lines from numerals 170-174 in fig. 15 and in fig. 16(b) as two lines 196 according to a second polarization orientation of 90 degrees, which is implicit based on the discussion of fig. 16(c) in col. 14, lines 26-28, rotated from a "correct orientation [of 180 degrees]" in col. 14, line 11 that is substantially orthogonal to said first polarization orientation because the first orientation of light, upper numeral 196, was rotated 90 degrees using the device of fig. 16(b), upper numeral 190, into lower device 190 where the second orientation of light is formed using a device, lower numeral 196, to rotate another 90 degrees to be received in num. 162.), and

a3) wherein the method (of fig. 16(b)) provides a substantially non-polarized light (or not rotated light or "rotate 180... [degrees]...back" in col. 14, line 11) to said imaging sensor device (Fig. 13, num. 22 or fig. 15, num. 170 that is included in fig. 16(b), num. 162.).

Claim 19 is rejected the same as claim 5. Thus, argument similar to that presented above for claim 5 is equally applicable to claim 19.

Claim 20 is rejected the same as claim 7. Thus, argument similar to that presented above for claim 7 is equally applicable to claim 20.

Claim 25 is rejected the same as claim 21. Thus, argument similar to that presented above for claim 21 is equally applicable to claim 25.

9. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Kleinberger et al. (US Patent 5,822,117 A).

Regarding claim 3, Kleinberger et al. discloses an imaging module for a digital still image capture device, comprising:

a) a shutter device (fig. 14a, num. 90 or fig. 19, num. 111) comprising a plurality of shutter element pairs (Fig. 14a, numerals 94 shown at least twice and fig. 19, num. 116 and 117), wherein each pair of shutter elements consists of a first individually addressable shutter element (via line connection 136 of fig. 19) having a first polarization orientation (fig. 14a, num. 94 shaded) and a second individually addressable shutter element having a second polarization orientation (fig. 14a, num. 94 not shaded) that is substantially orthogonal (or "90 degrees" in col. 31, line 55) to said first polarization orientation (Note that fig. 14a, num. 94 rotates light 90 degree. Thus, fig. 14, num. 94 shaded rotates light degrees relative to fig. 14, num. 94 that is not shaded.); and

b) an electronic imaging sensor device (fig. 14, num. 1) having a two-dimensional array of pixel sensors ("picture elements" in col. 31, line 38), wherein each shutter element pair corresponds (via a light path 93 of fig. 14) to a pair of pixel sensors (Fig. 14, num. 100 and 101.).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleinberger et al. (US Patent 5,822,117 A) in view of Furlani et al. (US Patent 5,708,893 A).

Regarding claim 12, Kleinberger et al. does not disclose microelectromechanical shutter element, but does teach that the shutter as taught in "not limited... to any particular... shutter" in col. 7, lines 36-38. Thus, Kleinberger et al. suggests that a plurality of shutter types is available to use with Kleinberger et al.'s invention.

Furlani et al. does teach a shutter that can be used with Kleinberger et al.'s invention as shown in fig. 8a and 8b and a "microelectromechanical shutter" in col. 1, line 26.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Kleinberger et al.'s shutters with Furlani et al.'s microelectromechanical shutters, because Furlani et al.'s microelectromechanical shutters are "highly advantageous" in col. 1, line 22.

12. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleinberger et al. (US Patent 5,822,117 A) in view of Sasagaki et al. (US Patent 5,541,707 A).

Regarding claim 13, Kleinberger et al. teaches the claimed memory or "programmed computing means" in col. 38, line 14 and does not teach the remaining limitations of claim 13, but does teach that the programmed computing means control a "switching means" in col. 38, line 14 of a shutter. Thus, Kleinberger et al. suggests that a program, which is inherently on a memory medium in a computing environment, controls the switching of the shutters. However, Kleinberger et al. does not teach a program that can perform the switching operation. Thus, one of ordinary skill in the art will need a program to perform the switching operation of Kleinberger et al.

Sasagaki et al. teaches a memory medium as shown in fig. 1,num. 103 and a program, fig. 1,num. 20 which is a driver or a program, that controls shutters as shown in fig. 4a, numerals 311-314 as taught by Kleinberger et al. and claim 13:

a) a memory (fig. 3,num. 23 "includes a memory" in col. 7, line 25) including an address storage ("first row" in col. 7, lines 30,31 of addresses as shown in fig. 7) capable of storing one or more shutter element addresses (fig. 4a, numerals 30a and 30b is an array of addresses of shutters.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Kleinberger et al.'s programmed computing means with Sasagaki et al.'s driver of fig. 1,num. 20, because Sasagaki et al.'s driver of fig. 1,num. 20 "arrange[s]...characters...in a well balanced and spaced manner" in col. 7, lines 53-55.

Claim 14 is rejected the same as claim 13. Thus, argument similar to that presented above for claim 13 is equally applicable to claim 14.

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13. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleinberger et al. (US Patent 5,822,117 A) in view of Bacs, Jr. et al. (US Patent 5,678,089 A) further in view of Ueyama et al. (US Patent 5,999,752 A).

Regarding claim 15, Kleinberger et al. teaches the claimed memory or "programmed computing means" in col. 38, line 14 and does not teach the remaining limitations of claim 13, but does teach that the programmed computing means control a "switching means" in col. 38, line 14 of a shutter. Thus, Kleinberger et al. suggests that a program, which is inherently on a memory medium in a computing environment, controls the switching of the shutters. However, Kleinberger et al. does not teach a program that can perform the switching operation. Thus, one of ordinary skill in the art will need a program to perform the switching operation of Kleinberger et al.

Bacs, Jr. et al. teaches a program or "programmed...computer" in col. 11, line 4 such as fig. 13, num. 156 or "algorithm" in col. 11, line 16 that enables the "switching" in col. 10, line 67 operation of fig. 13, num. 28 and shown in detail in fig. 8, num. 90 and teaches additional limitations of claim 13:

a) a memory including a pattern storage capable of storing one or more shuttering patterns (Fig. 13, num. 156 is a storage medium that "can readily introduce" in col. 10, lines 63,64 the exposure patterns or "apertures" in col. 10, line 65 as shown in figs. 5(a)-5(d). Note that readily introduce implies that a pattern is stored on the storage medium 156 of fig. 13, because the term "readily introduce" is used in the context of "programmed...computer" in col. 11, line 4 such as fig. 13, num. 156.)

b) shuttering patterns (as shown in fig. 8, numerals 92a and 92c. Note that fig. 8, numerals 92a and 92c can be substituted with the shapes of figs 5(a)-5(d). Thus, if the shape of 5(a) was placed next to another shape of 5(a) then is pattern is formed.) corresponding to a plurality of shutter elements (Fig. 8 shows a plurality of shutter elements represented as small squares.) to be actuated.

However, Bacs, Jr. et al. does not teach that a shuttering pattern specifies a plurality of exposure times, but teaches "auto-exposure techniques can be utilized...to...adjust the lens aperture..." in col. 8, lines 51-56 and an "lens aperture" in col. 10, line 16 that is "intermittent" in col. 10, line 15. Thus, Bacs, Jr. et al. suggests that a lens aperture can be intermittently be present at various points time and an auto exposure technique can be used with the lens aperture. Note that the lens aperture or apertures is shown in fig. 8, numerals 92a and 92c and also shown in fig. 4, numerals 71 and 73 and that fig. 8, num. 90 "can function as the camera shutter, as well as the lens aperture" in col. 15, lines 49-51.

Ueyama et al. teaches an exposure technique used with a lens aperture or shutter in fig. 1, num. 73 and 74, respectively, as suggested by Bacs, Jr. et al. and teaches the remaining limitation of claim 15:

a) shuttering patterns (fig. 1, num. 63) that specify a plurality of exposure times (fig. 14 is a timing graph as a function of a lens shutter and exposure).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to

a) first modify Kleinberger et al.'s teaching of a "programmed computing means" in col. 38, line 14 that can perform a switching operation with Bacs, Jr. et al.'s "algorithm" in col. 11, line 16, which enables the "switching" in col. 10, line 67 operation of fig. 13, num. 28 and shown in detail in fig. 8, num. 90 of Bacs, Jr. et al., to be implemented in Kleinberger et al.'s "programmed computing means" in col. 38, line 14.

b) second, modify the teachings of "auto-exposure techniques [that] can be utilized...to...adjust the lens aperture..." in col. 8, lines 51-56 and an "lens aperture" in col. 10, line 16 that is "intermittent" in col. 10, line 15 and fig. 8, num. 90 that "can function as the camera shutter, as well as the lens aperture" in col. 15, lines 49-51 of Bacs, Jr. et al. with the teaching of Ueyama et al.'s teaching of fig. 14 that is a timing graph as a function of a lens shutter and exposure, because Ueyama et al. provides an exposure technique that uses timing that is missing in the teaching of Bacs, Jr. et al.

14. Claims 21-23,26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacs, Jr. et al. (US Patent 5,678,089 A) in view of Inaba et al. (US Patent 4,958,912 A).

Regarding claim 21, Bacs, Jr. et al. teaches the apparatus of claim 1, wherein

a) at least one of said shutter exposure patterns (Fig. 8, numerals 92a and 92c is interpreted as a pattern since two objects as represented in fig. 8, numerals. 92a and 92c are separated by a space.) specifies a first group of shutter elements (Fig. 8, num. 92a: four white squares.) and a second group of shutter elements (fig. 8,num. 92c (one white square).), wherein said first group of shutter elements (fig. 8, num. 96 (four white squares)) includes one or more shutter elements (four white squares) that are not included in said second group of shutter elements (fig. 8,num. 92c (one white square)).

Bacs, Jr. et al. does not teach the remaining limitation, but does teach “abruptly switching cells” in col. 10, lines 66,67 and “gradually” in col. 11, line 1 switching cells. However, Bacs, Jr. et al. does not provide a method to perform switching cells. Instead, Bacs, Jr, et al. teaches hardware that is capable of switching in col. 10, lines 49-51. Thus, Bacs, Jr.et al. suggests to one of ordinary skill in the art a method of switching cells either abruptly or gradually or a combination of both.

Inaba et al. does teach a method as shown in figs. 3a-3d of switching cells or “open[ing] or clos[ing]...pixel[s]” in col. 6, lines 3,4 and hardware, in col. 6, line 6 as taught by Bacs, Jr. et al. and the remaining limitation of claim 21 of:

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b) at least one shutter exposure pattern also specifies a first exposure time period (fig. 3(d), label "B" has time period of "4".) for the first group of shutter elements (Figs. 3(d) and 4, label "B" represents a first group of shutter elements.) and a second exposure time period ("2" as shown in fig. 3(d), label "C.") for the second group of shutter elements (Figs. 3(d) and 4, label "C."), wherein the first exposure time period (4) is greater than the second exposure time period (2).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the pattern of Bacs, Jr. et al. with Inaba et al.'s teaching of opening and closing pixels according to a time chart, because Inaba et al. remedies the deficiencies of Bacs, Jr et al., i.e. Inaba provides a method for the hardware of Bacs, Jr et al. which is capable of switching cells on and off with respect to transparency.

Claims 22,23,26 and 27 are rejected the same as claim 21. Thus, argument similar to that presented above for claim 21 is equally applicable to claims 22,23,26 and 27 using fig. 3(d), label "A" with a time period of "8."

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15. Claims 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacs, Jr. et al. (US Patent 5,678,089 A) in view of MacAulay (US Patent 6,483,641 B1).

Regarding claim 24, Bacs, Jr. et al. teaches the apparatus of claim 1, wherein

a) at least one of said shutter exposure patterns (Fig. 8, numerals 92a and 92c is interpreted as a pattern since two objects as represented in fig. 8, numerals. 92a and 92c are separated by a space.) specifies a first group of shutter elements (Fig. 8, num. 92a: four white squares.) and a second group of shutter elements (fig. 8,num. 92c (one white square).), wherein said first group of shutter elements (fig. 8, num. 96 (four white squares)) includes one or more shutter elements (four white squares) that are not included in said second group of shutter elements (fig. 8,num. 92c (one white square)).

Bacs, Jr. et al. does not teach the remaining limitation of claim 24, but does teach a "progressively changing degrees of gray scale" in col. 11, lines for "cells" in col. 10, line 67 which are represented as small squares in fig. 8. Thus, Bacs, Jr. et al. suggests that each cell can have a progressive change in gray scale from black to white.

MacAulay teaches a progressive change in figures 2C,6, 7A and 7B as taught by Bacs, Jr. et al. and teaches the remaining limitation of claim 24:

a) wherein said at least one of said shutter exposure patterns (as shown by any one of figs. 4A-4I) also specifies a first opacity level (fig. 7B shows an gray scale "ON.") for the first shutter elements (any one black square of figs. 4A-4I) and a second opacity level (Fig. 7B: 80% ON) for the second group of shutter elements (Any one square of figs. 4A-4I other than the first shutter elements.), wherein the first opacity level is greater (darker as shown) than the second opacity level.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to Modify Bacs, Jr. et al.'s teaching of a "progressively changing degrees of gray scale" in col. 11, lines for "cells" in col. 10, line 67 with MacAulay's teaching of fig. 7B: gray scale "ON" and "80% ON" allows "light intensity...[to be]...reduced or increased as desired" in col. 18, lines 56,57.).

Claim 28 is rejected the same as claim 24. Thus, argument similar to that presented above for claim 24 is equally applicable to claim 28.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 6-3.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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